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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,254	02/11/2004	Hiroshi Iwata	0397-0475P	9897

2292 7590 06/22/2006

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EXAMINER

NGUYEN, TAN

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/775,254	IWATA ET AL.	
	Examiner	Art Unit	
	Tan T. Nguyen	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-22 is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. The amendment submitted by Applicant on June 8, 2006 has been received and entered.

2. Claims 1-2 and 4-22 are pending.

Claim 3 has been canceled.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakagami et al. (U.S. Patent No. 5,838,041).

Sakagami et al. disclosed in Figure 2 a nonvolatile memory cell comprising on a semiconductor substrate [1] a gate electrode (control gate) [13] is formed. Under the gate electrode [13], formed is an insulating layer [11] is made of silicon oxide film. On the surface of the substrate [1], source/drain regions are formed with the gate electrode [13] interposed therebetween. A diffusion layer [21] is a source in which an offset region is provided. Diffusion layers [16] and [20] are lightly doped drain structure. On the channel region between an edge of the gate electrode [13] and the diffusion layer [21], a layered film consisting of silicon oxide film [14] and a SiN film [17] is provided. The SiN film [17] is interposed between the silicon oxide films [14] and [18], constituting a sidewall [19] of the gate electrode [13]. The SiN film [17] is a charge accumulating layer. Each of the diffusion layers [20] and [21] is formed so as to overlap with the neighbor of the lower edge portion of the sidewall [19]. Contact plugs [25] connect an

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upper layer, namely, Al wiring to the source (diffusion layer [21]) and to the drain (diffusion layer [20]) respectively (column 4, lines 6-35). Conventionally, the Al wiring [26] are coupled to sense amplifier. The sidewall [19] would be understood as the claimed memory functional units, which have the SiN film for retaining charge, and the silicon oxide films [14], [18] for insulating film.

Regarding claim 4, as shown in Figure 2, the SiN film [17] having a surface parallel with the surface of the insulating film [11].

Regarding claim 5, as shown in Figure 2, the SiN film [17] is disposed substantially parallel with the side face of the gate electrode [13].

Regarding claims 6-7, since Applicant claimed the insulating film of the memory functional units has a thickness of 0.8 nm or more, or 20 nm or less, respectively, , Sakagami et al. disclosed the oxide film [14] should have a thickness less than 10 nm (column 4, lines 63-64).

Regarding claims 8-9, the claims are directed to the intended uses of the memory cell device. The memory device disclosed by Sakagami would be used in any portable electronic devices.

5. Claims 10-22 are allowed.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chang is cited to show memory cell having charge trapping layer on the side of the gate electrode.

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7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. **REMARKS**

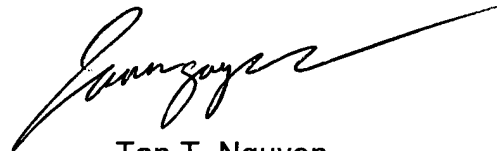
Applicant amended claims 1 and 10 by adding "being an insulator containing a silicon nitride" which was not presented in the original claims. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tan T. Nguyen whose telephone number is (571) 272-1789. The examiner can normally be reached on Monday to Friday from 07:00 AM to 03:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian, can be reached at (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tan T. Nguyen
Primary Examiner
Art Unit 2827
June 16, 2006